ADDENDUM III

Radioactive Waste Management Complex
Storm Water Pollution Prevention Plan
For Construction Activities

CONTENTS

Radioactive Waste Management Complex Storm Water Pollution Prevention Plan For Construction Activities

1. INTRODUCTION

This is a facility storm water pollution prevention plan for construction activities (SWPPP-CA) for the Radioactive Waste Management Complex (RWMC). This facility SWPPP-CA provides information about RWMC. Also, this is an addendum to the Idaho National Engineering and Environmental Laboratory (INEEL) SWPPP for Construction Activities—Generic Plan (DOE/ID-10425). The Generic Plan provides information and requirements common to the INEEL. This facility SWPPP-CA is intended to be used in conjunction with the Generic Plan. There is also an INEEL SWPPP for Industrial Activities (DOE/ID-10431), which provides requirements for industrial activities, maintenance actions, and permanent storm water controls.

2. FACILITY DESCRIPTION

The RWMC is located approximately 57 miles from Idaho Falls. The RWMC was established in 1952 with a 13-acre site to provide safe storage and disposal of solid radioactive waste. The mission of the RWMC is to provide waste management for the present and future needs of the INEEL and assigned Department of Energy (DOE) offsite generators of low-level and transuranic waste; to retrieve, examine, and certify stored transuranic waste for ultimate shipment to the Waste Isolation Pilot Plant in New Mexico; and to initiate and support research, development, and demonstration projects that will better enable the RWMC to manage waste in a manner that is cost-effective, safe for personnel, and safe for the environment.

2.1 Site Information

The RWMC is a complex of 165.5 acres and drains to a channel that is categorized as "waters of the United States." The soils are clay, silt, and fine sand with an average depth of 10 feet overlying basalt. See Appendix IIIA for additional soil information. Storm water quality has been measured, and is presented in the SWPPP for Industrial Activities.

This SWPPP-CA divides the RWMC into 3 zones according to land use. See Appendix IIIC for a facility map which shows the zones. Descriptions of the zones follow:

- Zone 1 is the Transuranic Storage Area (TSA); it covers approximately 57 acres in the southeast corner of RWMC. The area is surrounded by a security fence.
- Zone 2 is the Administrative and Operational Support Area; it covers approximately 54 acres in the northeast corner. Admittance to Zone 1 and 3 are monitored in this area.
- Zone 3 is the Subsurface Disposal Area (SDA); it covers approximately 57 acres on the west end of the RWMC. The area is surrounded by a security fence.

2.2 Existing Structural Controls

Structural (both natural and engineered) storm water controls that are in place at RWMC include the following:

- The natural gradient of the majority of the RWMC is very flat. The only exception is the southeast corner of Zone 1 (TSA), where the slope ranges from very flat to 1.3% to 2.5% in the southern most corner.
- A combination of contouring, ditches, inlets, culverts, and a pump divert storm water from within the RWMC fence to a drainage channel that intercepts the Big Lost River approximately 4 miles to the northeast.
- Low hills enclose the RWMC on three sides and form a watershed measuring approximately 10 km^2 (4 mi^2). Storm water from this watershed generally flows to the perimeters of the SDA and TSA and into the drainage channel.
- In 1962, a diversion drainage system was constructed around the perimeter of the SDA after a flood event. In 1969, the dikes surrounding the SDA were raised, and exterior drainage ditches

were enlarged in response to another flood event. After the flood event in 1982, additional work was conducted on the perimeter dike and drainage channel surrounding the SDA.

- The entire length of the channel is approximately 2.5 miles with an average slope of 0.095%. The channel floor through the RWMC to Adams Blvd is 50 ft wide. Past Adams Blvd, the channel narrows to 25 ft for approximately 4,400 ft. For the next mile, the channel has no specific sides and is distinguishable from the surrounding terrain only by wheel tracks. The last section of the channel is 20 ft wide with a gravel bottom. The channel bottom includes areas of significant vegetation, rock outcroppings, depressions, and animal burrows. In addition, there are two road crossings which would function as low dams (Jensen 1993).

2.3 Runoff Coefficient

The runoff coefficient for RWMC was not calculated because none of the planned projects are expected to cause an increase of the coefficient (see Appendix IIIB), except for the Advanced Mixed Waste Treatment Project. The Pit 9 Project is planned to be removed after restoration is complete. The utility projects will return the ground to its previous condition. The demolition projects will likely result in a decreased runoff coefficient. The project SWPPP-CA for the Advanced Mixed Waste Treatment Project will provide pre-construction and post-construction runoff coefficients.

2.4 Other Controls

The following documents address spill prevention measures and spill response procedures.

- *INEEL Emergency Plan/RCRA Contingency Plan*, Addendum 3, "RWMC" (LMITCOa)
- *Subcontractor Requirements Manual* (LMITCOb).

2.5 Site Map

In Appendix IIIC, the RWMC facility map shows drainage patterns, existing structures, and planned projects.

3. PLANNED ACTIONS

Appendix IIIB lists the planned actions in the RWMC for the next five years, including the expected construction year and area to be disturbed. The data are approximate due to funding and design uncertainty. Planned actions include new construction, demolition, environmental restoration, and any other actions that disturb ground, except for maintenance actions, which are covered under the SWPPP for Industrial Activities. See Appendix IIIC for the site map of RWMC, which shows planned project locations.

Typical actions at the RWMC include the following:

- Utility upgrades/expansion, including electricity, water, sewer, and transportation
- Communications upgrades/expansion, including telephone and radio
- Construction of buildings
- Demolition of buildings
- Decontamination and decommissioning
- Environmental restoration.

4. REFERENCES

DOE-ID, *INEL Storm Water Pollution Prevention Plan for Construction Activities*, DOE/ID-10425, U.S. Department of Energy Idaho Operations Office, Current revision.

DOE-ID, *INEL Storm Water Pollution Prevention Plan for Industrial Activities*, DOE/ID-10431, U.S. Department of Energy Idaho Operations Office, Current revision.

DOE-ID, *Sitewide Groundwater Monitoring Plan*, EGG-WMO-10383, U.S. Department of Energy Idaho Operations Office, November 1993.

Irving, J. S., 1993, *INEL Environmental Resources Document for the Idaho National Engineering Laboratory*, Volumes I and II, EGG-WMO-10279.

Jensen, S. A., 1993, *RWMC Draining Channel*, SAJ-09-93.

Lockheed Martin Idaho Technologies Company, *INEEL Emergency Plan/RCRA Contingency Plan,* Addendum 3, "Radioactive Waste Management Complex," Manual 16A-3, Current issue.

Lockheed Martin Idaho Technologies Company, *Subcontractor Requirements Manual*, Current issue.

Appendix IIIA

RWMC Geomorphology and Soils

The *INEEL Sitewide Groundwater Monitoring Plan* (DOE-ID 1993) includes the following discussion in the RWMC Sections 8.2.1, "Physiography," 8.2.2, "Geology," and Subsection 8.2.2.1., "Surficial Geology."

8.2.1 Physiography

The RWMC is located in a topographic depression in the southwestern portion of the INEEL. Land surface elevation increases away from the RWMC to the north, west, and south, outward a distance of a few hundred to a few thousand feet. Natural surface water drainage is directed toward the RWMC from all directions except the northwest.

At higher elevations, the topography follows the irregular surface formed by basalt flows thinly mantled by sediments. Basalt outcrops are common. Depressions in the basalt surface have been filled in by sediments, and consequently the relief in low-lying areas is subdued.

8.2.2 Geology

The geology of the RWMC area is know mainly from cuttings, cores, and geophysical logs from the approximately 45 wells that have been drilled at and near the facility. Because many of these wells terminate at shallow depths, data are more abundant for the near-surface environment than for deeper parts of the stratigraphic sequence.

8.2.2.1 Surficial Geology. A thin layer of eolian and alluvial sediments underlies the RWMC. The thickness of these sediments ranges from 0 to 6.7 m (0-22 ft), averages 3.1 m (10 ft), and is greatest inside the boundaries of the SDA. The irregularity in thickness of the surficial sediments is due to corresponding irregularities in the surface of the underlying basalt.

Eolian sediments have been deposited within the RWMC and on the leeward slope of the ridge to the west and southwest. The slope to the northeast of the facility has practically no surficial sediment. The eolian deposits generally consist of clay, silt, and fine sand. Small lenses of lacustrine clays and silts are also apparent in the surficial sediments beneath the RWMC (Barraclough et al. 1976).

Rightmire and Lewis (1987) were able to discern distinct stratigraphic units within the surficial sediment. They mapped the stratigraphy of a vertical wall 5.5 m (18 ft) high in Pit 15 in the SDA. The dominant lithology displayed in the wall is light-tan, fine-grained, glacial loess, which is interrupted at intervals by paleosol horizons, silt layers, and a layer of caliche.

Rightmire and Lewis (1987) reviewed particle-size analyses on surficial sediments reported by Barraclough et al. (1976). The samples analyzed include no particles larger than 1.0 mm and contained 70.0 to 95.2% material in size ranges less than 62 m. Although a few sand and gravel lenses are present, Rightmire and Lewis concluded that the surficial sediment in the vicinity of RWMC consists of predominantly silt-and clay-sized material.

Several samples of surficial sediments were taken from points below Pit 2 of the SDA. The bulk mineralogy of these samples was determined by X-ray diffraction. Except for one sample in which calcite

dominated, quartz and clay minerals were the dominant minerals present. Accessory minerals included potassium feldspar, plagioclase, and pyroxene.

Because a significant portion of the SDA is an engineered disposal area, the material covering the facility's pits and trenches consists of disturbed sediments. Much of this material was transported from lakebed deposits located about one mile southwest of the SDA. This lakebed area is now referred to as Spreading Area B, part of the INEEL diversion system. The average mineralogy of bulk surficial sediment at Spreading Area B is 35% quartz, 28% feldspar, 8% pyroxene, 5% calcite, 1% dolomite, and 23% clays with smectite and illite as the dominant clay minerals.

Physical characteristics of sediments near the RWMC are highly heterogeneous. Moisture content varies from about 2 to over 35% by mass based on 129 auger hole samples. Porosity also varies depending on the soil texture. Porosity of soils in the RWMC vicinity ranges from about 20 to 50% by volume. Effective porosity may be greater due to the existence of plant roots that have been observed in SDA trenches down to a depth of 3 m (10 ft).

Appendix IIIB

RWMC Planned Actions

Map Key[a]	Projects	Fiscal Year Construction Schedule	Area (ft^2)	Runoff Coefficient Information			
				Pavement (ft^2)	Roof (ft^2)	Permeable (ft^2)	No change
1	Electrical Upgrade	1998	85,000				X
2	Communications Alarm Upgrade with Interface with RAS	1998	200				X
3	SDA Engineered Barriers Test Facility	1997	10,000		+2,000	8,000	
4	WMF-711 Demolition	2001–2005	22,500		-22,500	+22,500	
5	WMF-612 Demolition	2001–2005	88,500		-88,500	+88,500	
6	Cold Test Pit	1997	100,000				X
7	SDA Pit 9 Retrieval Enclosure	1997	160,000				X
8	Advanced Mixed Waste Treatment Project	1999	TBD[b]	TBD	TBD	TBD	

a. Appendix IIIC.

b. To be determined

Appendix IIIC

Site Map